

SERPICHEVA, Z.S., inzh.

Methods for calculating and planning efficient organization of
milking by machinery. Nauch..trudy VIESKH 6:86-116 '59.
(MIRA 13:12)

(Milking machinery)

SERPIK, B.I.

Method of determining lateral influx of water into the river. Trudy
GGI no. 43:113-143 ' 54. (MIRA 12:1)
(Rivers)

SERPİK, N. M.

✓ Effect of the Form of Pearlite and the Ferrite Grain Size on the Properties of Steel Castings. M. M. Kantor and N. M. Serpik. (Liteinoe Proizvodstvo, 1955, (5), 19-21). [In Russian]. An investigation is described of the effect of the form of the structural components of annealed steel castings on various mechanical-property parameters. Specimens were subjected to various heat-treatments giving lamellar or granular pearlite. The tensile properties were determined and related to the form of the pearlite.--S.K.

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SERPIK, N.M., inzhener.

Investigating the wear resistance of blades used in excavating
machines. Stroi. i dor. mashinostr. 2 no. 5:17-18 My '57.
(Excavating machinery) (MIRA 10:6)

137-58-2-3417

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 2, p 162 (USSR)

AUTHORS: Serpik, N. M., Bekerman, Ye. A.

TITLE: Heat Treatment of Low-Alloy Steel Castings (Termicheskaya obrabotka otlivok iz nizkouglerodistoy stali)

PERIODICAL: Tekhnol. transp. mashinostroyeniya, 1957, Nr 7, pp 11-13

ABSTRACT: Eleven different heat treatment schedules for 8 melts of steel of the following percent composition: C 0.17-0.24, Mn 0.65-0.79, S 0.028-0.032, P 0.020-0.028, Si 0.28-0.33, were tested to clarify the effects of deviations in the heat temperatures and holding time upon the mechanical properties of steel, and also to determine the advantages of localized annealing (LA) over low-temperature treatment and the possibility of air cooling of steel when LA is performed. It was found from mechanical testing (for σ_b , σ_s , δ and ψ) and metallographic investigation that LA is a cheaper operation than low-temperature annealing and more conducive to improving plastic properties. Annealing followed by air-hardening is the most advantageous procedure. Temperature fluctuations from A_{c1} to $A_{c1}+60$, and holding time fluctuations from 15 to 90 minutes do not affect the mechanical properties.

Card 1/1

A. B.

1. Steel castings-Heat treatment.

SERPIK, N.M., inzh.; KANTOR, M.M., dots.

Increasing the wear resistance of soil-cutting blades. Stroi.
i dor. mashinostr. no. 4:33-34 Ap '58. (MIRA 11:4)
(Road machinery)

AUTHORS: Serpik, N. M., Engineer and Kantor, M.M., 129-58-7-11/17
Technical Sciences Candidate of

TITLE: Effect of Heat Treatment on the Wear Resistance of
Steel in Soil (Vliyaniye termicheskoy obrabotki na
iznosostoykost' stali v gruntovoy masse)

PERIODICAL: Metallovedeniye i Obrabotka Metallov, 1958, Nr 7,
pp 46-50 (USSR)

ABSTRACT: The authors investigated the wear resistance of various
steels in soil as a function of the composition, the
structure and the type of heat treatment, including
isothermal heat treatment which up to now is not being
used for components of earth working machinery. Isothermal
heat treatment at certain temperatures ensures the
formation of more uniform structures of carbide-ferrite
mixtures with smaller quantities of ultra-microscopic
cracks which should result in an increased wear resistance,
compared with components subjected to ordinary hardening
and subsequent tempering, for otherwise equal hardness.
The compositions of the investigated (seven) steels are
entered in Table 1, p.47; the average values of the wear
resistance of these steels as a function of the applied

Card 1/2

Effect of Heat Treatment on the Wear Resistance of Steel in Soil 129-58-7-11/17
heat treatment are entered in Table 2, p.48. The tests were carried out on a specially designed test stand in which the specimens were subjected to wear under conditions which closely resemble those in practical operation. On the basis of the results the authors conclude that hardness alone is not an adequate indication of the wear resistance of steel, since the conditions of heat treatment and the structure of the metal also play an important role. For the investigated steels isothermal heat treatment ensures a higher wear resistance than hardening followed by tempering. Maximum wear resistance was obtained for the steel U12 after isothermal heat treatment for producing acicular troostite with excess carbides. The wear resistance of this steel was 1.5 times as high as of ploughshare's steel heat treated to the same hardness by standard procedure.
Card 2/2 There are 4 figures and 2 tables.

ASSOCIATION: Bryanskiy institut transportnogo mashinostroyeniya
(Bryansk Institute of Transport-Machinery Construction)

KANTOR, M.M., kand.tekhn.nauk; SERPIK, N.M., inzh.; VENTSKOVSKIY, Z.L.,
inzh.; MERKULOVICH, V.A., inzh.

Investigating causes of wear of transmission gear boxes of
the D-265 motor grader. Stroi.i dor.mashinostr. 4 no.12:
17-19 D '59. (MIRA 13:3)
(Road machinery--Transmission devices)

YELISTRATOV, P.S.; SERPIK, N.M.

Effect of the removal by flame of steel casting defects on the
quality of welded joints. Lit.proizv. no.11:36-38 N '61.
(MIRA 14:10)

(Steel castings—Finishing)
(Welding—Testing)

L 15489-63 EWP(q)/EWT(m)/BDS AFFTC/ASD Pad JD
ACCESSION NR: AR3003754 S/0137/63/000/005/I058/I058

SOURCE: RZh. Metallurgiya, Abs. 5I316

AUTHOR: Kantor, M. M., Serpik, N. M.

TITLE: Investigation of chromium steels for their replacement of scarce chromium-nickel steels

CITED SOURCE: Tr. Bryanskogo in-ta transp. mashinostr., vy*p. 19, 1961, 294-300

TOPIC TAGS: chromium steel, hardness, viscosity tempering

TRANSLATION: The influence of the Cr and C content on a_k and the hardness of the steel after quenching with high tempering (T) was investigated on 16 steels of various compositions. The steels contained 0.21-0.88% C, 0.23-0.51% Mn, 0.14-0.52% Si, 1.10-4.08% Cr, 0.017-0.43% S, and 0.014-0.028% P. T was performed at 500, 600, and 700°. It was established that chromium steels yield to carbon Cr-Ni steels with respect to a_k only at T temperatures of 550-650°. In the case of T at 700°, the former steels surpass the latter both with respect to hardness and with respect to viscosity. Moreover, the higher the C content in

Card 1/2

L 15489-63

ACCESSION NR: AR3003754

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chromium steels, the greater the effect of alloying with Cr. For example, when the Cr content is increased from 0 to 3.5%, a_k increases from 16.6 to 20 kg-wt/cm² for steel with 0.35% C, from 9.2 to 18 kg-wt/cm² for steel with 0.6% C, and from 4.4 to 11.5 kg-wt/cm² for steel with 0.85% C. H_B for these steels changes from 183 to 220, from 166 to 315, and from 230 to 283, respectively. The data obtained indicate that high strength and a_k can be achieved in steel alloyed with Cr by increasing the T temperature after quenching to 700°. A. Sobolev.

DATE ACQ: 21 Jun 63

SUB CODE: ML

ENCL: 00

Card 2/2

SERPIK, N.M.; KANTOR, M.M.

Effect of chromium on the mechanical properties of improved
steel. Metalloved. i term. obr. met. no.5:28-29 My '64.

(MIRA 17:6)

1. Byranskiy institut transportnogo mashinostroyeniya.

SERPIK, N.M.; KANTOR, M.M.

Cast iron resistance to abrasive wear. Metalloved. i term. obr. met.
no.7:49-51 J1 '64. (MIRA 17:11)

1. Bryanskly institut transportnogo mashinostroyeniya.

BEKERMEN, F.A.; KANTOR, M.M.; SERPIK, N.M.; KUGEL', R.V.

Low-alloy steel for tractor track units. Lit. proizv. no.9:1-2 S '64.
(MIRA 18:10)

BEKFRMAN, F.L., inzh., SERPIK, N.M., kand. tekhn. nauk

Temperature for tempering crawler links from KDLVT steel.
Trakt. 1 sel'khoz mash. no. 10:42 0 '64. (MIRA 17-12)

1. Bezhitskiy staleliteynnyy zavod.

Кашин, Н.В., проф., МИИЭ. Инж., зап.техн.наук

Selection of steel and the thermal machining of parts of tractors
for use in the Far North. Trakt. i sel'khoz mash. no.2:42-43 F '65.
(MIRA 18:4)

SERPIK, N.M.; KANTOR, M.M.

Investigating the wear of steels by granular abrasives.
Tren. i izn. v mash. no.19:29-51 '64. (MIRA 18.3)

(N) L 10817-66 EWT(m)/EWA(d)/EWP(t)/EWP(z)/EWP(b) IJP(c) MJW/JD
 ACC NR: AP6000041 SOURCE CODE: UR/0343/65/000/009/0043/0043
 AUTHOR: ^{44,55}Bekerman, F. A. (Engineer); ^{44,55}Kantor, M. M. (Professor); ^{44,55}Serpik, N. M. (Candidate of technical sciences); ^{44,55}Romashov, B. A. (Engineer)
 ORG: [Bekerman] ^{44,55}Bezhitsk Steel Mill (Bezhitskiy staleliteyny zavod); [Kantor, Serpik] ^{44,55}Bryansk Institute of Transport Machinery Building (Bryanskiy institut transportnogo mashinostroyeniya); [Romashov] ^{44,55}Bryansk Automobile Plant (Bryanskiy avtomobil'nyy zavod)
 TITLE: Investigation of a new brand of steel for tracks of T-140 tractors
 SOURCE: Traktory i sel'khoz mashiny, no. 9, 1965, 43
 TOPIC TAGS: steel, tracked vehicle, high alloy steel, vehicle component, *CHEMICAL COMPOSITION, CARBON STEEL, SOLID MECHANICAL PROPERTY, T-140 TRACKED VEHICLE, 18KhGST STEEL, 20KhG2ST STEEL*
 ABSTRACT: The Bezhitsk Steel Mill (Bezhitskiy staleliteyny zavod), Bryansk Institute of Transport Machinery Building (Bryanskiy institut transportnogo mashinostroyeniya), and Bryansk Automobile Plant (Bryanskiy avtozavod) have conducted a study aiming to replace the high-alloy and expensive KDLVT steel for tracks of T-140 tractors with either 20KhG2ST or 18KhGST steel. The chemical compositions of the two steels investigated are given in Table 1 (in %). The 20KhG2ST steel was chosen over the 18KhGST steel because a high carbon content leads to a reduction in the impact strength of the steel, and test melts with a high magnesium content showed cracks when the castings were hammered out of their molds. It is noted that
 Card 1/2 UDC: 669.14.018:629.11.01.012.57

L 10817-66

ACC NR: AP6000041

15

Brand of steel	C	Mn	Si	Ti	Cr	P	S
20KhG2ST	0,17—0,24	1,3—1,6	0,5—0,8	0,06—0,1	0,6—0,9	<0,045	<0,045
18KhGST	0,15—0,22	1,0—1,3	0,5—0,8	0,08—0,1	0,6—0,9	<0,045	<0,045

Table 1. Chemical composition of 20KhG2ST and 18KhGST steels

the cost per ton of the experimental steel is 40 rubles below that of KDLVT steel, and that the mechanical treatment of the former is considerably easier than that of the latter. T. G. Perevezentsev, R. S. Zhigalenkova, L. S. Dubova, and L. D. Smirnova, of TsZL of Bezhitsk Steel Mill, took part in determining the mechanical properties of the steel. Orig. art. has: 2 figures and 3 tables.

SUB CODE: 11, 13 / SUBM DATE: none

Card

2/2

SERPIK, N. M., Cand. Tech. Sci. (diss) "Abrasive Wearing Capacity
of Steels and Cast Irons in Connection with their Composition,
Micro-structure and Thermal Processing," Moscow, 1961, 16 pp.
(Moscow Steel Inst.) (KL Supp 12-61, 274).

2000-10-10 E.M.
SVERDLOV, Veniamin I'ich; MEDVINSKIY, I.Ye., inzh., retsenezent; LIPNITSKIY, A.M., red.; SERPIKOV, B.M., inzh., red.; LEYKINA, T.L., red. izd-va; PETERSON, M.M., tekhn. red.

[Mechanization of operations for the pouring of metal into molds, the shakeout and the cleaning of castings] Mekhanizatsiia rabot po zalivke form, vybivke i ochistke lit'ia. Pod obshchei red. A.M.Lipnitskogo. Moskva, Gos. nauchno-tekhn. izd-vo mashinostroit. lit-ry, 1961. 66 p. (Bibliotekha liteishchika, no.10) (MIRA 14:9)
(Foundries--Equipment and supplies)

SERFIKOV, S. K.

Cand Agr Sci - (diss) "Soils of the northeastern part of the Alma-Atinskaya Oblast of the Kazakh SSR (in the boundaries of the former Taldy-Kurganskaya Oblast)." Alma-Ata, 1961. 20 pp; (Ministry of Higher and Secondary Specialist Education Kazakh SSR, Kazakh State Agricultural Inst); 200 copies; price not given; (KL, 6-61 sup, 232)

SOKOLOV, S.I.; ASSING, I.A.; KURMANGALIYEV, A.B.; SERFIKOV, S.K.;
BEZSONOV, A.I., glav. red.; BOROVSKIY, V.M., red.; SOKOLOV,
A.A., red.; STOROZHENKO, D.M., red.; USPANOV, U.U., red.;
SHEVCHUK, T.I., red.; ROROKINA, Z.P., tekhn. red.

[Soils of the Kazakh S.S.R. in 16 volumes] Pochvy Kazakhskoi
SSR v 16 v puskakh. Alma-Ata, Izd-vo Akad. nauk Kazakhskoi
SSR. Vol.4. [Alma-Ata Province] Pochvy Alma-Atinskoi oblasti.
1962. 422 p. (MIRA 15:4)

1. Akademiya nauk Kazakhskoy SSR, Alma-Ata. Institut pochvovedeniya.

(Alma-Ata Province---Soils)

SERPIKOVA, L.A.; MININA, R.M., prof.

Treatment of children with the aftereffects of poliomyelitis at the
"Belorussia" Sanatorium. Zdrav. Bel. 6 no.11:25-27 N '60.
(MIRA 13:12)

1. Glavnyy vrach sanatoriya "Belorussiya" (for Serpikova).
2. Direktor Nauchno-issledovatel'skogo instituta travmatologii i
ortopedii (for Minina).

(POLIOMYELITIS)

MAL'NEV, A.F.; KREMENCHUGSKIY, L.S.; BEREZKO, B.N.; SHEVTSOV, L.N.;
BOGDEVICH, A.G.; KIRILLOV, G.M.; CHASHECHNIKOVA, I.T.;
YARMOLENKO, N.A.; OFFENGENDEN, R.G.; SERMAN, V.Z.;
DALYUK, Yu.A.; BEREZIN, F.N.; KONENKO, L.D.; SHALEYKO, M.A.;
SHEVCHENKO, Yu.S.; STOLYAROV, V.A.; KIRILLOV, G.M.; BOGDEVICH, S.F.;
LYSENKO, V.T.; BRASHKIN, N.A.; SKRIPNIK, Yu.A.; GRESHCHENKO, Ye.V.;
TUZ, R.M.; SERPILIN, K.L.; GAPCHENKO, L.M.

Abstracts of completed research works. Avtom. 1 prib. no.3:90-91
Jl-S '62. (MIRA 16:2)

1. Institut fiziki AN UkrSSR (for all except Skripnik,
Greshchenko, Tuz. Serpilin, Gapchenko). 2. Kiyevskiy
politekhnicheskii institut (for Skripnik, Greshchenko, Tuz,
Serpilin, Gapchenko).

(Research)

CA

Electric conductivity of electrolyte mixtures. V. K. Semenchuk and V. V. Serpinski. *J. Gen. Chem.* (U. S. S. R.) 3, 470-7 (1953). The elec. conductivities were studied of KCl in the concn. interval 0.000125-2.0 N, of NaBr 0.001-1.0 N, of NaBr 0.000125-0.005 N, of MgSO₄ 0.000100-2.0 N; of mixts. KCl + NaBr at total concns. of 0.1 and 0.001 N with ratios of components 3:1, 1:1 and 1:3; KCl + MgSO₄ at total concns. of 0.001, 0.01, 0.1 and 2.0 N in the same ratios of components; KCl + NaBr + MgSO₄ at total concns. of 0.005 and 0.0005 with ratios of components 1:1:1 and 1:1:2. Data on the double and triple mixts. in small concns. are in good agreement with the elec. cond. values calcd. on the basis of additivity of sp. cond. W. P. Ericks

ADDITIONAL LITERATURE CLASSIFICATION

Electrical conductivity of mixtures of electrolytes. V. V. Semenchenko and V. V. Serpinski. *Trans. U.I. Mendeleev Congr. Theoret. Applied Chem.* 1932 2, Pt. 2, 195-200(1935); cf. *C. A.* 27, 3382; 28, 10059.—Elec. conductivities of a series of binary and ternary mixts. at const. total concns. but different ratios of the components and at different total concns. were measured with the aid of a special device that is described. The data obtained were consistent with the Debye-Hückel-Onsager theory and confirmed the adequacy of the method applied. The formula $A = ZaiAi$ seems to be confirmed for the additive cond. (ai is the part played by the given electrolyte in the mixt., expressed in equivalents, Ai the elec. cond. of the pure electrolyte of a concn. corresponding to that of the mixt.). E. E. Stefanowsky

PROCESSES AND PROPERTIES INDEX

ASAC 35A METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS		PROCESSES AND PROPERTIES INDEX		100 AND 1TH SERIES	
<p><i>ca</i></p> <p>Method of measuring adsorption of gases and vapors by solids. B. P. Bering and V. V. Serpinski. <i>Compt. rend. acad. sci. U.R.S.S.</i> 55, 731-4(1947)(in English).-- A method is described for direct measurement of adsorption not by the change of wt. of the adsorbent but by the direct and independent weighing of the adsorbate. By use of a Mellin-type balance with a sensitivity of the order of 10^{-5} g., with an adsorbent wt. of about 50 g. and a mol. wt. of the adsorbate of 30 to 100, the sensitivity of the method is 10^{-4} millimoles/g. The method is especially convenient in studying the low-pressure region of the adsorption isotherm, in the investigation of adsorption of gaseous mixts. and adsorbents of small sp. surface, and in measuring differential heats of adsorption.</p> <p style="text-align: right;">Frank Conet</p>					
<p>ASB-5LA METALLURGICAL LITERATURE CLASSIFICATION</p>					
FROM SYNDICATE		BELLISTONE		FROM BOMINIV	
100000 0 1 2 3 4 5 6 7 8 9		100000 0 1 2 3 4 5 6 7 8 9		100000 0 1 2 3 4 5 6 7 8 9	

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2

Adsorption of methanol vapor on barium sulfate. B. P. Ierling and V. V. Serpinski (M. V. Lomonosov State Univ., Moscow). *Doklady Akad. Nauk S.S.S.R.* **58**, 1001-4 (1947); cf. C.A. **43**, 461k.—Exptl. results of adsorption of MeOH vapor on BaSO₄ are given graphically, the data being collected at 20°. The adsorption isotherm has S-shape, with apparent unimol. adsorption up to $k \approx 0.3$, followed by multilayer adsorption, with 2nd layer completed at $k \approx 0.68$ and 3rd at $k \approx 0.90$. The isotherm equation is $\log(a/k) = Aa^2 + B = (A - 1)a^2 + B$, which in this instance gives $A = 9.88 \times 10^{-3} \text{ g.}^2/\mu\text{M}^2$ and $B = -6.16$. The Harkins-Jura equation (C.A. **38**, 1932²⁴) applies only to a narrow range of a values, whereas the above formulation agrees with exptl. data from $a = 0$ to $a = 62$. G. M. Kosolapoff

USSR/Physics

Sep 48

Adsorption
Adsorbents

"Adsorption of Vapors on Crystalline Adsorbents,"
B. P. Berling, Inst of Phys Chem, Acad Sci USSR,
V. V. Serpinskiy, Moscow State U imeni M. V. Lomonosov,
Moscow, 13 $\frac{1}{2}$ pp

"Zhur Fiz Khim" Vol XXII, No 9 - p.1858

Measures adsorption of CH_3OH vapors on BaSO_4 at
20 and 500 C, showing that BaSO_4 is nonporous, and
computes differential heat of adsorption. In poly-
molecular adsorption, extensive layer-formation is

56/49T89

USSR/Physics (Contd)

Sep 48

shown to occur only close to the saturation point.
Submitted 30 Jan 48.

SERPINSKIY V V

56/49T89

SERPINSKIY, V.V.

The adsorption of vapors on crystalline adsorbents.
H. P. Bering and V. V. Serpinskiy. *Problemy Kinetiki i
Kataliza 7, Statisticheskie Yavleniya v Geterogen. Sistemakh*,
383-409(1949); cf. C.A. 43, 461f.—Data are given for the
adsorption of C_2H_5OH on $BaSO_4$ and compared with data
obtained previously for $MeOH$. The adsorption of C_2H_5OH
is accompanied by greater energy effects than is that
of $MeOH$. The decrease in the adsorption potential with
increasing surface filling is greater for C_2H_5OH than it is for
 CH_3OH .
J. Rovtar Leach

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MET

SERPINSKIY, V. V.

USSR/Chemistry - Adsorption

11 Jul 51

"Monomolecular Adsorption on Uniform Surfaces,"
B. P. Bering, V. V. Serpinskiy, Inst of Phys Chem,
Acad Sci USSR; Moscow State U imeni M. V. Lomonosov

"Dok Ak Nauk SSSR" Vol LXXIX, No 2, pp 273-276

Studies the effect of the mutual interaction of adsorbed mols. Derives 2 eqs, one for a localized layer and one for a nonlocalized layer of mols adsorbed on a uniform surface. Plots the adsorption isotherms corresponding to them.

21479

ADSORPTION

A new method for investigating the adsorption of gases and vapors. Trudy Inst.fiz, khimii AN SSSR no. 1, 1952.

Monthly List of Russian Accessions, Library of Congress, December 1952. Unclassified.

SCIENT, P. 1., SCIENT, P. 1.

Adsorption

Adsorption from a gas mixture. 1. Adsorption of ethylene and carbon dioxide by activated carbon. Zhur. Fiz. Khim. 26 no. 2. '52.

Monthly List of Russian Accessions, Library of Congress, September 1952. Unclassified.

CATALYST

Chemical Abst.
Vol. 48 No. 9
May 10, 1954
General and Physical Chemistry

: Adsorption of mixtures of gas. II. Adsorption of ethylene
and propylene on active carbon. B. P. Bering and V. V.
Serepinski. Bull. Acad. Sci. U.S.S.R., Div. Chem. Sci.
1952, 877-84 (Engl. translation).—See C.A. 47, 5756f.
H. L. H.

(2)
Chem

9-2-54
EJP

SERPINSKIY, V.V.

British Abst.

A I

Aug. 1953

Physical Properties and Molecular
Structure of Solutions, Etc.

Adsorption of gas mixtures. II. Simultaneous adsorption of ethylene and propylene on active carbon. B. P. Beling and V. V. Serpinin. *Izvestia*, 1952, 997-1007. The adsorption of C_2H_4 and propylene on active C is determined, using the same method and the same active C as in Part I (*J. phys. Chem., USSR*, 1952, 28, 256). The adsorption of pure gases and their mixtures is measured at 7° and 25° in the total pressure range 0-350 mm. From the study of the three-dimensional adsorption models (where two ordinates represent partial pressures of gases and the third one the adsorption, expressed in millimoles per g. of C) it is seen that the adsorption of propylene is only slightly decreased in presence of even large amounts of C_2H_4 , the slope of the adsorption isotherm remaining unchanged. In contrast, the adsorption of C_2H_4 is appreciably reduced by admixture of even small amounts of propylene and the adsorption isotherm becomes already linear when partial pressure of propylene reaches 50 mm. Expressions for the integral heat of adsorption of the binary gas mixture and for the differential heats of adsorption of each component are derived and the differential heats are calculated and plotted as a function of adsorption. The presence of propylene lowers considerably the differential heat of adsorption of C_2H_4 , whereas that of propylene is virtually unaffected by the presence and partial pressure of C_2H_4 . It follows, that the mol. of propylene are adsorbed on the portions of surface of high adsorption energy and mol. of C_2H_4 on the portions of low adsorption energy.

S. K. LACHOWICZ

5-21-54

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Chem
ref

SERPINSKIY, J. I.

Chemical Abst.
Vol. 48 No. 9
May 10, 1954
General and Physical Chemistry

7
(6)
Adsorption properties of montmorillonite clays. B. P. Mat.
Berids, V. P. Dreving, A. V. Kiselev, V. V. Serpinskiy, M.
O. Suraya, and K. D. Shcherbakova. Colloid J. (U.S.S.R.),
14, 433-41 (1952) (Engl. translation).—See C.A. 47, 5080c.
H. L. H.

USSR/Chemistry - Adsorption

Feb 52

"Adsorption of Gas Mixtures. I. Adsorption of Ethylene and Carbon Dioxide on Activated Carbon," B. P. Berling, V. V. Serpinsky, Inst of Phys Chem, Acad Sci USSR; Moscow State U Imeni M. V. Lomonosov

"Zhur Fiz Khim" Vol XXVI, No 2, pp 253-269

Describes procedure for precise measurement of adsorption of binary gas mixts which is based on volumetric dosage of components of gas mixt and analysis of equil gas phase by detg heat cond. Measured adsorption of carbon dioxide-ethylene mixts

211T50

on activated carbon at 25.4° within wide range of concns at pressures of equil gas phase between 0-300 mm Hg. Discusses thermodynamic relationships which govern the adsorption of each component; establishes thermodynamic criterion which must be satisfied by any valid theory of adsorption of gas mixts; criticizes E. C. Marham and A. F. Benton's theory (J Am Chem S, Vol LIII, 497, 1931). Proves empirically that there is no dependence of coeff of selectivity on compn of equil gas phase provided that total pressure is const; that this coeff, calcd for the more highly adsorbable component, drops with total pressure. Shows inapplicability of theory advanced by S. Z. Roginsky and O. M. Todes to system under study.

211T50

SERPINSKIY, V. V.

USSR/Chemistry - Adsorption

Aug 52

"The Simultaneous Adsorption of Ethylene and Propylene on Activated Carbon," B. P. Bering and V. V. Serpinskiy, Inst of Phys Chem, Acad Sci USSR; Moscow State U

"DAN SSSR" Vol 85, No 5, pp 1065-1068

The presence of propylene in the adsorption phase greatly lowers the differential heat of adsorption of ethylene, while the differential heat of adsorption of propylene remains practically unchanged. Propylene, adsorbing on the most active parts of a

239T21

nonuniform surface, blocks the adsorption of ethylene mols. Submitted by Acad M. M. Dubinin 27 May 52.

239T21

СЕРПИНСКИЙ, В. В.

Adsorption of mixtures of gases. III. Possibility of a
statistical treatment of the adsorption of a mixture of gases.
B. P. Bering and V. V. Serpinskiy. *Bull. Acad. U.S.S.R.*
Div. Chem. Sci. 1953, 33-41 (Engl. translation).—See *C.A.*
47, 5757c. H. L. H.

6



SERPINSKY, V. V.

Adsorption of mixtures of gases. III. Possibility of statistical
treatment of adsorption of gas mixtures. B. P. Bering and V. V.
Serpinsky (*Izvestia*, 1953, No. 1, 37-47).—Mathematical.
W. MANZ

SERPINSKIY, V. V.
~~Serpinskiy, V. V.~~

USSR .

✓ Adsorption of mixtures of gases. IV. Adsorption of
water vapor and of ethyl chloride on active charcoal. B. P.
Bering and V. V. Serpinskiy. *Bull. Acad. Sci. U.S.S.R.,*
Div. Chem. Sci. 1953, 881-9 (Engl. translation).—See C.A.
48, 7982.
H. L. H.

Adsorption of mixtures of gases. IV. Adsorption of water vapors and of ethyl chloride on active charcoal. B. P. Bering and V. V. Serpinskiĭ (Inst. Phys. Chem. Sci. U.S.S.R., Moscow). *Izvest. Akad. Nauk S.S.S.R. Otdel. Khim. Nauk* 1953, 957-67; cf. *C.A.* 47, 5757c, C. 1. 48, 4927f. — A vol.-wt. method is described for measuring the simultaneous adsorption of a binary mixt. of gases or vapors on solid adsorbents. Measurements were made on the simultaneous adsorption of mixts. of H_2O and $EtCl$ on active charcoal at 74° over an interval of relative pressures of water vapor from 0 to 0.85 and of partial pressures of $EtCl$ from $P_2 = 0$ to 180 mm. Hg. The adsorption isotherms for water at $P_2 = \text{const.}$ move with rising values of P_2 toward the right from the origin of coordinates, while the slope of the middle linear portion increases. At const. partial pressures of $EtCl$ and with increasing relative pressures h of water vapor above 0.5, a sharp decrease in the adsorption of $EtCl$ is observed. On further increase of h the $EtCl$ almost completely drives the water from the charcoal. The space-geometry of the increase in adsorption during the adsorption of binary mixts. is discussed. It is shown that within the limits of the Langmuir theory, as the pressure increases, the coeff. of satn. γ approaches unity. It was found that for the adsorption of mixts. of $H_2O + C_2H_5Cl$ on charcoal at high pressures, γ approaches 5, and hence in the adsorption five mols. of H_2O are equiv. to one mol. of C_2H_5Cl . It is shown that the difficulties that arise in the interpretation of the results obtained from the point of view of the concept of a capillary condensation of water for the system studied, and considering one of the other possible mechanisms for the adsorption of water on charcoal, based on the assumption of a 2-dimensional phase passing over into an adsorption layer, depends on the formation of H bonds between the adsorbed water mols. Exptl. results are shown by means of 10 figures. P. H. R.

No-6

13-5
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U S S R .

✓ Determination of the vapor pressures of several fragrant substances. V. V. Serpinskiy, S. A. Voitkevich, and N. Yu. Lyuboshits (Inst. Synthetic and Natural Aromatic Compds., Moscow). Zhur. Fiz. Khim. 27, 1032-8 (1953); cf. Granovskaya, C.A. 42, 2489d. — The vapor pressures (p) between 20 and 80° were detd. of p'peronal (I), coumarin (II), vanillin (III), vanillin (IV), 1-methyl-4-*tert*-butyl-3-methoxy-2,6-dinitrobenzene (V), and 2,6-dimethyl-3,5-dinitro-4-*tert*-butylacetophenone (VI) in a described and illustrated high-vacuum app. in which the rate of effusion of the satd. vapor of the given substance was measured with a sorption balance. Values of p for I-VI were plotted as functions of temp. The calcd. heats of sublimation for I-VI were 21.7, 20.6, 24.3, 21.2, 24.6, and 25.8 kcal./mole, resp. The calcd. heats of vaporization (from the liquid state) of I, II, and IV are 15.7, 16.6, and 19.1 kcal./mole, resp.

J. W. Lowelker, Jr.

BERING, B.P.; SERPINSKIY, V.V.; DUBININ, M.M., akademik.

Volumetric-gravimetric method for measuring the adsorption of gaseous mixtures. Dokl.AN SSSR 90 no.5:811-814 Jo '53. (MLRA 6:5)

1. Institut fizicheskoy khimii Akademii nauk SSSR (for Bering, Serpinskiy).
2. Akademiya nauk SSSR (for Dubinin). (Gases) (Adsorption)

~~SECRET~~
SERPINSKIY, V.V.; VOYTKEVICH, S.A.; LYUBOSHITS, N.Yu.

Determination of the saturated vapor pressure of several fragrant
substances. Trudy VNIISNDV no.2:108-113 '54. (MLRA 10:7)
(Odorous substances) (Vapor pressure)

USSR/Chemistry

Card 1/1

Authors : Serpinskiy, V. V., Voytkevich, S. A., and Lyuboshits, N. Yu.

Title : The pressure of saturated vapor of certain odoriferous substances. Part 2. -

Periodical : Zhur. Fiz. Khim., 28, Ed. 5, 810 - 813, May 1954

Abstract : The pressures of saturated vapor of benzyl acetate, cinnamic alcohol, phenylethyl alcohol, alpha-terpineol and indole were investigated by the effusion method at 10 - 55°. It was shown that the values obtained at the investigated temperatures could be quite accurately expressed by the Clausius-Clapeyron equation and integrated under the assumption of a constant concealed heat of evaporation (sublimation). Nine references: 4-USSR, 2-German since 1923 - 1928, 2-English, 1-USA. Table, graphs.

Institution : All-Union Scient. - Res. Institute of Synthetic and Natural Odiferous Substances, Moscow.

Submitted : July 13, 1953

SERPINSKIY, V.V.

CH ✓ Determination of saturated vapor pressure of several fragrant substances. III. V. V. Serpinskiy, S. A. Volkovich, and N. Yu. Lyuboshits (All-Union Inst. Synthetic and Nat. Aromatic Principles, Moscow). *Zhur. Fiz. Khim.* 28, 1889-74 (1954); cf. *C.A.* 49, 8877c. — The vapor pressures of phenylacetaldehyde (I), Me anthranilate (II), citronellol (III), cyclamen aldehyde (IV), *p*-acetylanisole (V), and pentadecanolate (VI) were measured by a previously described effusion method (*loc. cit.*) at temps. from 10 to 60°. Tabulated values of *A* and *B* in the equation $\log p = -(A/T) + B$ (where *p* is the observed vapor pressure in mm. and *T* is the abs. temp.), as well as the heat of sublimation (or vaporization) in kcal./mole, resp., are for I, 2846, 9.138, 13.0; II (c.), 4094, 11.988, 18.7; II (l.), 3252, 9.160, 14.9; III, 3447, 9.757, 15.8; IV, 3794, 10.549, 17.3; V (c.), 4892, 14.217, 22.4; V (l.), 3474, 9.693, 15.9; VI (c.), 4245, 10.890, 19.4; VI (l.), 3878, 9.730, 17.7; c. and l. refer to, cryst. and liquid states, resp.

J. W. Loweberg, Jr.

✓ The measurement of the adsorption of nitrogen on sodium chloride using a quartz microbalance with high sensitivity. B. P. Bering and V. V. Serpinskiĭ. *Doklady Akad. Nauk S.S.S.R.* 94, 497-500(1954).—A quartz microbalance is described, which is very similar to that devised earlier by Samukhov (*C.A.* 47, 5729c). With this balance, the amt. of N adsorbed on finely powdered NaCl was detd. at 77 and 90°K. From the adsorption isotherms, values were calcd. for the heat of adsorption, Q . The curve of Q vs. u (u is the adsorption in micromoles N/g. of NaCl) has a max. that corresponds to a degree of filling of the surface of 1.

J. Rovtar Leach

Inst. Phys. Chem., AS USSR

Serpinskiy, V.V.

USSR/ Physics - Physical chemistry

Card 1/1 Pub. 22 - 39/63

Authors : Dubinin, M.M., Academician; and Serpinskiy, V.V.

Title : Equation of isotherm of water vapor adsorption on active carbons

Periodical : Dok. AN SSSR 99/6, 1033-1036, Dec 21, 1954

Abstract : In order to learn more about the sorption nature of water vapors on active carbons the authors investigated the isotherm and sorption heats on non-porous carbon adsorbents - thermal treated carbon black - the surface chemical nature of which is not much different from the surface of active C. zones where the isotherms show a sharp rise. The complexity of the sorption process for water vapors in the entire range of equilibrium relative pressures makes a simple approach to a quantitative description of the complete sorption branch of the isotherm less perspective. It was determined that the porous structure of C does not affect adsorption of water vapors. Ten references: 2-USA and 8-USSR (1930-1954). Graph.

Institution: Academy of Sciences USSR, Institute of Physical Chemistry

Submitted: October 20, 1954

AFY0137

TRANSURE ISLAND BOM REVIEW

ADJ 2.1 - S

SEMPER, V. I. AND B. P. LARIN, (Institute of Physical Chemistry, Academy of Sciences, USSR).

IZMERNENIE ADSORBTIV PAROV AZOTA NA KRISTALLAN KHLO-ISTORO DAIPIYA PRI
POPSHCHENIYEM VESOV VYSOKOY CHUVSTVITEL'NOSTI (measurement of the
adsorption of nitrogen vapors on sodium chloride crystal with a highly-sen-
sitive quartz balance). In Problemy kinetiki i kataliza (Problems of Kinetics
and Catalysis), vol. 6. Izdatel'stvo Akademii Nauk SSSR, 1955. Section 7:
New experimental methods. p. 243 - 247.

An illustration and description of a quartz microbalance developed in the
Laboratory for Sorption Processes of the Institute for Physical Chemistry of
the Academy of Sciences, U.S.S.R. is given in Fig. 1 (p. 244). Adsorption of
nitrogen was determined at 77 and 90°K on a highly dispersed NaCl preparation
with a surface equal to 3000 cm². The adsorption isotherms for N₂ on NaCl at 77
and 90°K are shown in Fig. 2 (p. 246). Four diagrams, 6 references, 3 Russian
(1948 -1955).

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U.S.S.R. V V

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U.S.S.R.

Sorption of water vapor by active carbon. M. M. Dubinin, E. D. Zaverina, and V. V. Serbina. (Inst. Phys. Chem., Acad. Sci. U.S.S.R., Moscow). *J. Chem. Soc.* 1955, 1760-6. — A detailed study was made of sorption isotherms of water vapor on a nonporous, heat-treated channel black, the surface area of which was measured by benzene adsorption (by the B.E.T. method) and electron microscope, with good agreement, and on a no. of samples of active C. For both materials the main rise of the sorption isotherm up to points where they bend corresponds to unimol. adsorption. The region of multimol. adsorption extends to high relative pressures, approaching 0.95. The ratio of adsorption of the active C to that of the channel black at the same relative pressure was const.; this fact indicates no capillary condensation. An equation is proposed to explain the results up to the pronounced break characteristic of the end of unimol. adsorption. By this equation, the vol. of adsorption q is related to the no. of primary adsorption centers z_0 , the relative pressure h , and the ratio α of the kinetic consts. of adsorption and desorption as follows: $q = z_0 h / (1 - \alpha h)$. The results are discussed in the light of the hypothesis that the principal role is that of H bonding. U. L. Harris.

BERING, B.P.; SERPINSKIY, V.V.

Measuring nitrogen-vapor adsorption on sodium chloride crystals
by means of highly sensitive quartz scales. Probl.kin.i kat.
8:243-247 '55. (MLRA 9:5)

1. Institut fizicheskoy khimii AN SSSR.
(Adsorption) (Nitrogen) (Sodium chloride)

SERPINSKIY, V.V.; VOYTKEVICH, S.A.; LYUBOSHITS, N.Yu.

Determination of saturated vapor pressure for certain aromatic principles.
Part 4. Zhur.fiz.khim. 29 no.4:653-657 Ap '55. (MLRA 8:8)

1. Institut sinteticheskikh i natural'nykh dushistykh veshchestv, Moskva.
(Vapor pressure) (Essences and essential oils)

BERKENGHEYM, B.M.; SEMENOV, N.N.; SERPINSKIY, V.V.

Nikolai Aleksandrovich Shilev; on the 25th anniversary of his death. Zhur.fiz.khim.29 no.9:1730-1735 S '55. (MLRA 9:4)
(Shilev, Nikolai Aleksandrovich, 1872-1930)

SECRET

USSR/ Chemistry - Physical chemistry

Card 1/1 Pub. 147 - 21/35

Authors : Serpinskiy, V. V.; Voytkovich, S. A.; and Lyuboshits, N. Yu.

Title : Determination of the saturated vapor pressure of certain aromatic principles

Periodical : Zhur. fiz. khim. 30/1, 177-183, Jan 1956

Abstract : The saturated vapor pressures of p-methylacetophenone, gamma-phenylpropyl alcohol, citral, d- and l-linalyl acetate, musk-xylene and benzophenone were measured at close to room temperatures. All aromatic principles but benzophenone were investigated in liquid state only. Benzophenone was studied in liquid and crystalline states. It was found that the vapor pressures of d- and l-linalylacetate, obtained from different raw materials, were practically identical. The results obtained from the other aromatic principles are shown in tables. Twenty-seven references: 11 USSR, 5 Germ., 1 Eng., 1 Swiss, 1 USA, 1 Danish (1925-1955). Tables; graphs.

Institution : Inst. of Synthetic and Natural Aromatic Principles, Moscow

Submitted : June 16, 1955

SECRET, V.V.

62-1-20/21

AUTHORS: Bering, B. P., and Serpinskiy, V. V.

TITLE: Letter to the Editor (Pis'ma redaktoru)

PERIODICAL: Izvestiya Akademii Nauk, SSSR, Otdeleniye Khimicheskikh Nauk, 1957,
No. 1, page 125 (U.S.S.R.)

ABSTRACT: The letter to the editor states that certain differential heats of
adsorption Q can be measured calorimetrically or calculated thermodynamically
in accordance with the Clausius-Clapeyron equation from adsorption
isosteres. The purpose of this letter is to show that from a certain
conditions (2) it is possible to derive, in a strictly thermodynamic way,
an equation allowing one to calculate $Q - Q$ in accordance with one adsorp-
tion isotherm. The form of the thermal equation is described.

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Letter to the Editor

62-1-20/21

ASSOCIATION: Academy of Sciences of the USSR, Institute of Physical Chemistry

PRESENTED BY:

SUBMITTED: December 18, 1956

AVAILABLE: Library of Congress

Card 2/2

USSR/Physical Chemistry - Surface Phenomena, Adsorption, Chromatography, Ion Interchange,

E-13

Abst Jour: Referat. Zhurnal Khimii, No 2, 1958, 4014.

Author: B. P. Bering, M. M. Dubinin, Ye. G. Zhukovskaya, A. I. Sakharov, V. V. Serpinskiy.

Inst:

Title: Study of Porous Structure of Solid Bodies by Sorption Methods. III. Gravimetric Methods of Measuring Sorption and Desorption Isotherms of Nitrogen and Benzene Vapors.

Orig Pub: Zh. fiz. khimii, 1957, 31, No 3, 712-716.

Abstract: With a view to select and substantiate the most rational methods of measuring isotherms of vapor sorption (IS) on solid bodies, an improved vacuum installation was constructed; this installation permits reliably to take down the IS of N₂ at a low temperature and the IS of benzene vapors at the room temperature by the gravimetric method. The IS-s determined with the described

USSR/Physical Chemistry - Surface Phenomena, Adsorption, Chromatography, Ion Interchange.

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Abs Joru: Referat. Zhurnal Khimiya, No 2, 1958, 4014.

installation for N_2 at -195° on silica gel and for benzene vapors at 20° on activated carbon coincided practically with corresponding IS-s taken down by the volumetric (N_2) or gravimetric methods by other authors on other installations. (See part II in RZhKhim, 1957, 26362.)

SERPINSKIY, V. V.

4
Saturated vapor pressure determination of some fragrant substances. VI. V. V. Serpinskiy, S. A. Volkovich, and N. Yu. Lyuboshits (Inst. Synthetic and Natural Aromatic Principles, Moscow). *Zhur. Fiz. Khim.* 31, 1278-84 (1957); *cf. C.A.* 50, 10468g, 16231e.—The satd. vapor pressure of some perfumery materials was measured at 12-60° by the effusion method described previously. The values of the consts. A and B in the equation $\lg p = -A/T + B$ and the latent mol. heat of vaporization Q , calcd. for the substances investigated, were, resp.: benzyl alc., $A = 3214$, $B = 9.638$, $Q = 14.7$ kcal./g.-mol; *tert*-butylcyclohexyl acetate, 3333, 9.847 and 16.2 kcal./g.-mol; benzyl benzoate, 4057, 10.115, and 13.3; α -ionone, 3538, 10.036 and 16.1; β -ionone, 3005, 10.085 and 16.5; eugenol 3455, 9.726, and 15.8; isoeugenol (mixture of *cis* and *trans* isomers) 3658, 9.024, and 16.7. The transition from compounds with isolated double bonds (α -ionone, eugenol) to compounds with conjugated bond systems (β -ionone, isoeugenol) strengthened the intermol. bonds and lowered the vapor pressure.
W. M. Sternberg

Serpinskiy, V.V.
USSR/Physical Chemistry - Surface Phenomena, Adsorption, Chromatography, Ion Interchange.

B-13

Abs Jour: Referat. Zhurnal Khimiya, No 2, 1958, 3995.

Author : B.N. Vasil'yev, B.P. Bering, M.M. Dubinin, V.V. Serpinskiy.
Inst : Academy of Sciences of USSR.
Title : Study of Adsorption Under High Pressure.

Orig Pub: Dokl. AN SSSR, 1957, 114, No 1, 131-134.

Abstract: The CO₂ adsorption on two silica gel specimens in the range from -85 to +40° and under the pressure of from 0 to 85 atm was studied using the instrument described earlier (RZhKhim, 1957, 74788). The adsorption hysteresis loop is observed only in the range from -60 to -20°. The isotherms of -30 and -50° bring to a not coinciding distribution of pore volumes according to their radii. The total substance content differs noticeably under high pressures from Gibbs' adsorption. It is shown that the mean density ρ_a of CO₂ in the adsorbed state

Card : 1/2

-5-

AUTHORS: Bering, B. P. and Serpinskiy, V. V.

20-114-6-32/54

TITLE: Calculation of the Heat and Entropy of Adsorption According to a Single Adsorption Isotherm (Vychisleniye teploty i entropii adsorbtsii po odnoy izoterme adsorbtsii)

PERIODICAL: Doklady AN SSSR, 1957, Vol. 114, Nr 6, pp. 1254-1256 (USSR)

ABSTRACT: Either direct calorimetric measurements or thermodynamic calculations are used for determining the values of the heat and entropy of sorption in dependence on the quantity of the sorbed substance. The calculations are based on an empirical determination of the sorption-temperature coefficient. Although both methods are fundamentally clear and do not cause any doubt, they are very toilsome and make great demands on the quality of the experiment. The authors show under which conditions these important thermodynamic characteristics can be calculated according to one isotherm, as mentioned in the title. The extensive test material confirms the basic postulate of Polyani: The so-called adsorption potential $\epsilon = -RT \ln h$ (where h signifies the relative pressure) is, at a constant value of the filled adsorption-volume $\varphi = aV$ (a - adsorption, V - molar volume of the adsorbate),

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Calculation of the Heat and Entropy of Adsorption According to 20-114-6-32/54
a Single Adsorption Isotherm

calculations from the adsorption-isosteres. Examples for this are given (figures 1, 2). Equation (7) is only completely valid when condition (1) is satisfied. Nevertheless it may be expected that equation (7) will in many other cases also yield a good agreement with the test even when condition (1) is not satisfied. Actually $Q = -T\Delta S + \xi + \lambda(10)$, and from the equation 7a $[q = (\alpha - \xi)RT^2 (\partial \ln h / \partial \ln a)_T - RT \ell nh]$ follows that every deviation from condition (1) only influences the term $T\Delta S$. Therefore considerable values of ξ will also only bring about a small error of the Q -value, when the specific gravity of the term $T\Delta S$ in equation (10) is not high. Theoretically it is, however, completely undue to disregard the term $T\Delta S$. A corresponding analytical form of the dependence of the differential adsorption-heat on a or on h may be obtained by the combination of the analytical expression for the equation of the adsorption isotherm with equation (7). The method of analysis of the adsorption problems resulting from this may become very promising. There are 2 figures and 4 references, 1 of which is Slavic.

Card 3/4

SERPINSKIY, V.V.; VOYTKEVICH, S.A.; LYUROSHITS, N.Yu.

Results of determining the saturated vapor pressures of 36
odorous substances. Trudy VNIISNDV no.4:125-130 '58.

(MIRA 12:5)

(Essences and essential oils)
(Vapor pressure)

SERPINSKIY, V. V.; LUK'YANOVICH, V. M.; RADUSHKEVICH, L. V.; TSITSISHVILI, J. V.; YERMO-
LENKO, N. F.; DUBININ, M. M.; BERING, B. P.;

"The adsorption from vapors and Liquids."

report presented at the Fourth All-Union Conference on Colloidal Chemistry,
Tbilisi, Georgian SSR, 12-14 May 1958 (Koli zhur. 20,5, p.677-9, '58, Taubman, A.B)

5 (4)

AUTHORS:

Bering, B. P., Dubinin, M. M.,
Serpinskiy, V. V.

SOV/62-59-6-5/36

TITLE:

Calculation of the Differential Heats of Vapour Adsorption on
Active Coal (Vychisleniye differentsial'nykh teplot adsorbtsii
parov na aktivnykh uglyakh)

PERIODICAL:

Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk,
1959, Nr 6, pp 981-988 (USSR)

ABSTRACT:

Besides applying other methods, the differential adsorption heat
may thermodynamically be calculated by means of a model of the adsorption
interaction and the theory of molecular forces. In a previous
paper by the author (Ref 1) it was shown that according to the
potential theory of adsorption the differential heat of an
adsorption isotherm may be computed by the following equation:

$$q = Q - \lambda = \alpha RT^2 \left(\frac{\partial \ln h}{\partial \ln a} \right)_T - RT \ln h \quad (1).$$

Here Q denotes the total,

and q the pure differential adsorption heat, λ the latent
vaporization heat, α the thermal coefficient of the spatial
extension of the adsorbed substance, a the adsorption, and $h=p/p_s$
the relative pressure. The characteristic curves of the volume
distribution for inhomogeneous adsorption surfaces of different

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Calculation of the Differential Heats of Vapour
Adsorption on Active Coal

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type, in the present case active coal, on the adsorption range are known from publications. These curves lead to equations for the adsorption isotherms of different structural types.

$$\text{(Equations 4 and 5) } a = \frac{w_0}{v} e^{-\frac{BT}{\beta^2} (\lg h)^2} \quad \text{(I) (4)}$$

$a = \frac{w_0'}{v} e^{\frac{AT}{\beta} \lg h}$ (II) (5). Here w_0 (w_0') B (A) denote structural characteristics of the adsorbents, β the affinity coefficient, and v the mole volume. Based upon the equations 1 and 4, or 1 and 5, a term for the differential adsorption heat of vapour of different substances on active coal may be set up. For the purpose of facilitating the computation, this equation was established in variable θ (of the filling degree of the micropores). By following this equation the differential adsorption heat at different numerical values θ was computed for a number of substances on a standard adsorbent at different temperatures. Active coal of the type (I) served as standard adsorbent. The

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Calculation of the Differential Heats of Vapour
Adsorption on Active Coal

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values obtained for q are given in a table. A figure shows the dependence of Q on θ for normal heptane, hexane, and pentane. In an analogous manner the equation holding for the differential adsorption heat on coal of the second structural type was derived. For the first type computations of the adsorption heats of different hydrocarbons were carried out (Table 2). For this computation it was necessary for the two structural characteristics W_0 , B (W_0' , A) of the adsorbent, tabular values on the pressure of the saturated vapour, its mole volume, its parachor, and the thermal coefficient of the volume distribution of the substance to be adsorbed to be known. Finally, an approximative calculation method for the differential heat of the alkanes on adsorbents of the first structural type was worked out. There are 1 figure, 2 tables, and 12 references, 10 of which are Soviet.

ASSOCIATION: Institut fizicheskoy khimii Akademii nauk SSSR (Institute of Physical Chemistry of the Academy of Sciences, USSR)

SUBMITTED: October 24, 1957
Card 3/3

5 (4)

AUTHORS:

Bering, B. P., Serpinskiy, V. V.

SOV/62-59-7-6/38

TITLE:

Adsorption of Gas Mixtures (Adsorbtsiya smesi gazov).
Communication 5. Adsorption Balance in the System Water - Ethyl
Chloride - Activated Carbon (Soobshcheniye 5. Adsorbtsionnoye
ravnovesiye v sisteme voda - khloristy etil - aktivnyy ugol')

PERIODICAL:

Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk,
1959, Nr 7, pp 1186-1195 (USSR)

ABSTRACT:

In this paper the experimental data on the adsorption of the
gases mentioned in the title on activated carbon of two different
types are compared (the type I on which the investigations were
carried out already in a previous paper and the type II had a
different porosity) and conclusions are drawn on the
characteristic of the adsorption balance. For the investigations
the adsorption isotherm of water and ethyl chloride and of the
mixture of both was recorded volumo-gravimetrically at 75°
in a new apparatus (Ref 1). The obtained data of the individual
substances are given in tables 1 and 2 and in figures 1 and 2.
The sections of the thermodynamic surfaces were determined from
the data obtained and the adsorption balance from the constancy
of different thermodynamic parameters. All sections of carbon II

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Adsorption of Gas Mixtures. Communication 5. Adsorption SOV/62-59-7-6/38
Balance in the System water - Ethyl Chloride - Activated Carbon

obtained were analogous to the corresponding one of carbon I. From the great number of the isotherms obtained those were regarded in which the adsorption of one component is constant. In figure 3 the adsorption isotherms of water are described accordingly. The curves are represented according to the formula $c = c_0 (1 - ka_2)$ (1) (where a_2 is the value of the adsorption of ethyl chloride; c_0 is a parameter for the individual water isotherm at constant value a_0). The set of curves of the adsorption isotherms for ethyl chloride at constant a_1 is represented in figure 2. The following investigation is carried out by means of the latter set of curves according to the conception of the potential adsorption theory of Dubinin (Refs 2, 4, 6). The parameters W_0 (W) and B of the equation (4) of Dubinin, Zaverina and Radushkevich (Ref 4) were determined (Table 4) characterizing the adsorbent and represented in dependence of α (Fig 6). Investigations revealed that the adsorption of the ethyl chloride at constant a_1 may be represented

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Adsorption of Gas Mixtures. Communication 5.

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Adsorption Balance in the System Water - Ethyl Chloride - Activated Carbon

by the mentioned equation. The density of the water being adsorbed in the micropores is considerably higher than the density otherwise at the same temperatures. The transition to the sorption in the field of the capillary condensation is characterized by a decrease of the density of the water. The fusion of the two mentioned equations (for $a_1 = \text{const}$ and for $a_2 = \text{const}$) describes the adsorption of the mixture of both components on the activated carbon by means of the parameter of the individual adsorption isotherms of both substances if also the empiric parameter on the adsorption of the water $a_1 \ll 2 \text{ mM/g}$ is given. Finally the authors thank M. M. Dubinin for his interest in this paper and for valuable discussions held together. There are 6 figures, 5 tables, and 6 Soviet references.

ASSOCIATION: Institut fizicheskoy khimii Akademii nauk SSSR (Institute of Physical Chemistry of the Academy of Sciences, USSR)

SUBMITTED: November 21, 1957
Card 3/3

AUTHORS: Bering, B. P., Dubinin, M. M., Academician, S/020/60/131/04/041/073
Zhukovskaya, Ye. G., Serpinskiy, V. V. B004/B125

TITLE: Molecular Sieves as Adsorbents of the First Structural Type

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol 131, Nr 4, pp 865 - 867 (USSR)

TEXT: The authors divide the porous adsorbents into structural types according to the size of their pores. Second structural type: silica gel with large pores and active coal with large pores. First structural type: silica gel with fine pores, active coal with fine pores, and zeolite. They tested whether zeolite belongs to the first structural type by means of the potential theory of adsorption developed in their institute. They present the equation of the adsorption isotherm (1), which establishes a linear relation between the logarithm of the adsorption a and the square of the logarithm of the relative pressure $h = p/p_s$. The isotherms of nitrogen and benzene in fine-pored silica gels (Ref 4) may be determined in a wide temperature range by determining the constants W_0 and B of the equation (1) and the affinity β of the molecular volume v and the partial pressure p_s of the saturated vapor. For the molecular sieve "Linde 5A" the experiments were carried out with nitrogen at -195° . Figure 1 shows the results of

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Molecular Sieves as Adsorbents of the First Structural Type

S/020/60/131/04/041/073
B004/B125

the experiments. The curves of the adsorption of nitrogen and argon on chabazite according to reference 6 were added for comparison. The validity of the equation (1) was tested on the basis of the determined constants by calculation of the adsorption isotherms for chloromethyl on chabazite at 0, 50, and 100°. Figure 2 shows the result. The experimental data of R. M. Barrer and D. W. Brook (Ref 9) is entered for comparison. At 50° there is good agreement between the data calculated by the authors and the experimental data from reference 9. At 100° the experimental data is somewhat lower, at 0° somewhat higher; but the deviation is at most only 5%. The authors arrive at the conclusion that the equation (1) is applicable to the study of the adsorption on zeolite and that the molecular sieves may be considered adsorbents of the first structural type. There are 2 figures and 11 references, 7 of which are Soviet.

ASSOCIATION: Institut fizicheskoy khimii Akademii nauk SSSR (Institute of Physical Chemistry of the Academy of Sciences, USSR)

SUBMITTED: December 30, 1959

Card 2/2

BERING, B.P.; SERPINSKIY, V.V.

Properties of surface solutions and surface heterogeneity. Izv.AN
SSSR Otd.khim.nauk no.3:406-414 Mr '61. (MIRA 14:4)

1. Institut fizicheskoy khimii Akademii nauk SSSR.
(Adsorption)

BERING, B.P.; LIKHACHEVA, O.A.; SERPINSKIY, V.V.

Adsorption of mixtures of ethylene with carbon dioxide on carbon
black. Izv.AN SSSR Otd.khim.nauk no.4:551-559 Ap '61.
(MIRA 14:4)

1. Institut fizicheskoy khimii AN SSSR.
(Ethylene) (Carbon dioxide) (Adsorption)

BERING, B.P.; SERPINSKIY, V.V.

Adsorption of gas mixtures. Report No.6: Adsorption equilibrium
in the system water - n.heptane - silica gel. Izv.AN SSSR.Otd.khim.-
nauk no.11:1947-1954 N '61. (MIRA 14:11)

1. Institut fizicheskoy khimii AN SSSR.
(Heptane) (Silica) (Adsorption)

S/076/61/035/001/021/022
B004/B060

AUTHORS: Bering, B. P. and Serpinskiy, V. V.

TITLE: Academician Mikhail Mikhaylovich Dubinin (on the occasion of his 60th birthday)

PERIODICAL: Zhurnal fizicheskoy khimii, v. 35, no. 1, 1961, 225-227

TEXT: This is an article on the scientific activity of M. M. Dubinin, written on the occasion of his 60th birthday on January 1, 1961. He began his scientific activity in 1920 as a student of Nikolay Aleksandrovich Shilov, and investigated problems of theoretical analysis and practical application of sorption effects on porous bodies. On this field he published more than 250 papers. On the basis of the classical theory of the adsorption potential, he worked out a method of solving scientific and practical problems in this field, which makes it possible to calculate the most important parameters of sorption equilibrium (degree of adsorption, differential heats, adsorption entropy, etc.) for any vapors within a wide range of temperatures and pressures, including the critical and trans-critical ranges. The method is sufficiently accurate for most practical

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Academician Mikhail Mikhaylovich Dubinin ...

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B004/B060

purposes. Dubinin worked out a classification of adsorbents on the basis of their structure. His great experience in chemical technology enabled him to make practical use of his research work for the improvement of commercial sorption processes. Mention is made of his many papers on theoretical and practical problems of gas defense and of the manufacture and commercial use of molecular sieves (synthetic zeolites). Special lectures and laboratories on sorption processes were organized under Dubinin's supervision. In 1943, he was appointed Member of the Academy of Sciences USSR. Since 1948 he has been Academician-Secretary of Otdeleniye khimicheskikh nauk Akademii nauk SSSR (Department of Chemical Sciences, Academy of Sciences USSR) and a member of the Presidium of the Academy. In 1946 he was elected President of Vsesoyuznoye khimicheskoye obshchestvo im. D. I. Mendeleyeva (All-Union Chemical Society imeni D. I. Mendeleyev). In addition, Dubinin is a deputy to the Verkhovnyy Sovet RSFSR (Supreme Council of the RSFSR), and was twice awarded the Stalin Prize and also the Order of the USSR. There is 1 figure.

Card 2/2

BERING, B.P.; DUBININ, M.M., akademik; SERPINSKIY, V.V.

Adsorption isosters in the potential theory. Dokl.AN SSSR 138
no.6:1373-1376 Je '61. (MIRA 14:6)

1. Institut fizicheskoy khimii AN SSSR.
(Adsorption) (Potential, Theory of)

377-4341, VV

128

PHASE I BOOK EXPLOITATION

SOV/6246

Soveshchaniye po tseolitam. 1st, Leningrad, 1961.

Sinteticheskiye tseolity; polucheniye, issledovaniye i primeneniye
(Synthetic Zeolites: Production, Investigation, and Use). Mos-
cow, Izd-vo AN SSSR, 1962. 286 p. (Series: Its: Doklady)
Errata slip inserted. 2500 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Otdeleniye khimicheskikh
nauk. Komisiya po tseolitam.

Resp. Eds.: M. M. Dubinin, Academician and V. V. Serpinskiy, Doctor
of Chemical Sciences; Ed.: Ye. G. Zhukovskaya; Tech. Ed.: S. P.
Golub'.

PURPOSE: This book is intended for scientists and engineers engaged
in the production of synthetic zeolites (molecular sieves), and
for chemists in general.

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Synthetic Zeolites: (Cont.)

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COVERAGE: The book is a collection of reports presented at the First Conference on Zeolites, held in Leningrad 16 through 19 March 1961 at the Leningrad Technological Institute imeni Lensovet, and is purportedly the first monograph on this subject. The reports are grouped into 3 subject areas: 1) theoretical problems of adsorption on various types of zeolites and methods for their investigation, 2) the production of zeolites, and 3) application of zeolites. No personalities are mentioned. References follow individual articles.

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Synthetic Zeolites: (Cont.)

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THEORETICAL PROBLEMS OF ADSORPTION ON ZEOLITES.
METHODS OF INVESTIGATION

- Dubinin, M. M., Z. A. Zhukova, and N. V. Kel'tsev. Appli-
cability of the Potential Theory to the Adsorption of
Gases and Vapors by Synthetic Zeolites 7
- Bering, B. P., V. V. Serpinskiy. Adsorption Isotheres for
Synthetic Zeolites Within the Framework of the Potential
Theory 18
- Timofeyev, D. P., O. N. Kabanova, I. T. Yerashko, and A. S.
Ponomarev. The Role of the Secondary Porosity of Zeolites
in the Kinetics of Water-Vapor Sorption 24
- Misin, M. S., B. V. Adrianova, and M. N. Adrianov. Investi-
gation of the Adsorption and Kinetic Properties of Granu-
lar Zeolites With the Aid of Thoron 31

Card 3/12 3

BERING, B.P.; SERPINSKIY, V.V.

Thermodynamic criterion for the applicability of the potential
theory of adsorption. Dokl. AN SSSR 148 no.6:1331-1334 F
'63. (MIRA 16:3)

1. Institut fizicheskoy khimii AN SSSR.
(Adsorption) (Thermodynamics)

BERING, B.P.; SERPINSKIY, V.V.; SURINOVA, S.I.

Adsorption of vapor mixtures and the structure of adsorbents. Dokl.
AN SSSR 154 no.6:1417-1420 1964. (MIRA 17:2)

1. Institut fizicheskoy khimii AN SSSR. Predstavleno akademikom M.M.
Dubininym.

BERING, B.P.; SERPINSKIY, V.V.; SURINOVA, S.I.

Preliminary computation of adsorption equilibrium parameters
for the system adsorbent - binary mixture of vapors. Dokl.
AN SSSR 153 no.1:129-132 N '63. (MIRA 17:1)

1. Institut fizicheskoy khimii AN SSSR. Predstavleno akademi-
kom M.M. Dubininym.

BERING, B.P.; SERPINSKIY, V.V.; SURIMOVA, S.I.

Adsorption of vapor mixtures on zeolites. Izv. AN SSSR Ser.
khim no.7:1309-1311 J1 '64. (MIRA 17:8)

1. Institut fizicheskoy khimii AN SSSR.

L 20352-66 EWT(m)/EWP(j)/T RM

ACC NR: AP6012079

SOURCE CODE: UR/0062/65/000/005/0769/0776

AUTHOR: Bering, B. P.; Serpinskiy, V. V.; Surinova, S. I.

29
B

ORG: Institute of Physical Chemistry, AN SSSR (Institut fizicheskoy khimii AN SSSR)

TITLE: Adsorption of a mixture of gases. Communication 7. Joint adsorption of a binary mixture of vapors on activated charcoal

SOURCE: AN SSSR. Izvestiya. Seriya khimicheskaya, no. 5, 1965, 769-776

TOPIC TAGS: adsorption, diethyl ether, chloroform, gas adsorption

ABSTRACT: A method was developed for calculating the parameters of adsorption equilibrium of a binary mixture of vapors on an adsorbent within the framework of the theory of volume filling of micropores (potential theory of adsorption). The adsorption isotherms on activated charcoal were measured for diethyl ether at 50, 60, and 71°, ethyl chloride at 50 and 71°, chloroform at 60°, and for mixtures of ethyl chloride with diethyl ether at 50 and 60° and diethyl ether with chloroform at 60°. A generalization of the Dubinin-Radushkevich equation for the adsorption of an individual substance on adsorbents of the first structural type was proposed for the cumulative adsorption of the components of a binary system of vapors. This equation was found to be a good approximation of the experimental data. The generalization of the Dubinin-Radushkevich equation, in conjunction with the Lewis empirical equation, can be used for an approximate calculation of the adsorption of each component of the mixture according to the set partial equilibrium pressures of the components, if the phase diagram of

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ACC NR: AP6012079

volume solutions of these substances is known. The differential heats of adsorption of the components from the mixture were calculated for the ethyl chloride-diethyl ether system. Orig. art. has: 7 figures, 1 table, and 11 formulas. [JPRS]

SUB CODE: 07 / SUBM DATE: 10May63 / ORIG REF: 008 / OTH REF: 003

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vmb

MUMINOV, A.C.; BOLENG, B.P.; CERPINSKIY, V.V.

Capillary condensation thermodynamics. Izv. AN SSSR. Ser. Khim.
no. 1:43-55 1966. (MIRA 19:1)

1. Institut Fizicheskoy khimii AN SSSR. Submitted July 3, 1965.

SERPIONOV, N.N., professor, kandidat tekhnicheskikh nauk.

Technical calculations for rigidity of rotary press printing units.
Nauch.trudy MZPI no.2:125-149 '55. (MLRA 9:3)

(Printing press)

SERPIONOV, N. N.

124-11-13295

Translation from: Referativnyy Zhurnal, Mekhanika, 1957, Nr 11, p 144 (USSR)

AUTHOR: Serpionov, N. N.

TITLE: On the Stresses in the Constrained Ends of Beams.
(O napryazheniyakh v zashchemlenykh kontsakh balok.)

PERIODICAL: Sb. tr. Mosk. zaochn. poligr. in-t, 1957, Nr 5, pp 151-152

ABSTRACT: It is proposed that the well-known solution of the two-dimensional polynomial problem of the theory of elasticity be utilized in the evaluation of the stresses in the constrained ends of beams having a rectangular cross section. It is assumed, a priori, that the normal forces are linearly distributed and that there are no tangential reactions along the constrained longitudinal edges of the beam.

The problem is posed incorrectly. The distribution of the reaction on the constrained portions must be found from the equation of the theory of elasticity, with the stipulation that the constrained ends are not subjected to displacement.

V. K. Prokopov

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14(10)

PHASE I BOOK EXPLOITATION

SOV/2163

Serpionov, Nikolay Nikolayevich, Professor

Kurs lektsiy po soprotivleniyu materialov; dlya studentov tekhnologicheskogo fakul'teta (Course of Lectures on the Resistance of Materials; for Engineering Students) Moscow, 1958. 184 p.
1,000 copies printed.

Sponsoring Agency: Moskovskiy zaochnyy poligraficheskiy institut.

Ed.: I.D. Kamkina.

PURPOSE: This is a textbook for students of Engineering Departments of universities.

COVERAGE: This is a concise course on the strength of materials. The book discusses stresses and deformations of rigid bodies under the action of tension, compression, torsion, simple and longitudinal flexure, and under combined stresses. A special chapter describes concepts of strength under variable stresses and gives examples of practical computations of fatigue strength. An outline history of

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Course of Lectures (Cont.)

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the development of the science of the strength of materials is given. The following personalities are mentioned: M.V. Ostragradskiy, mathematical theory of elasticity; D.I. Zhuravskiy, Engineer, theory of flexure of bars; Kh. Golovin, exact solution of the problem of stresses in a curved bar; F.S. Yasinskiy, first to present the problem of resistance beyond the limit of proportional deformations; M.M. Filinenko-Borodich, I.I. Rabinovich, and N.V. Kornoukhov, problems of strength, stability, and vibrations; N.N. Davidenkov and S.V. Serensen, stresses in impacts and fatigue strength. There are no references.

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JOHN L. ROY, Ye.I.; DYMELETSKIY, Ye.I.; LITVINOV, I.V.; YEREMEEV, A.S.

Calculating the flooding rate for gas-solid systems in cornerless plate towers. Trudy VNIIT no.47:66-98 162. (USSR 1969)

SERPIONOVA, YE IV										PROCESSES AND PROPERTIES INDEX									
CN										2									
A rapid method for determining the vapor-pressure term of liquid mixtures and of solutions. V. A. Kisev, E. N. Serpionova and N. S. Matyushin. J. <i>Applied Chem.</i> (U. S. S. R.) 6, 709-71 (1953). The app. consists of 2 burets leading to a common container for the mixt. of liquids which is equipped with an elec. (magnetic) stirring device, and a pressure gage for measur- ing the increase in pressure. The app. is first evacuated and one of the liquids is admitted to the mixing vessel, the second liquid is then admitted gradually, the operation being accompanied by steady stirring. All measurements must be made at a const. temp. The effects of given proportions of the second liquid, read on the second buret, on the vapor pressure of the liquid are plotted. A few examples are given. A. A. Bochtungk																			
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SERPIONOVA, Yelizaveta Nikolayevna; LUCHINSKIY, G.P., redaktor; SHPAK, Ye.G.,
tekhnicheskiiy redaktor

[Industrial adsorption of gases and vapors] Promyshlennaia adsorbtsiia
gazov i parov. Moskva, Gos. nauchno-tekhn. izd-vo khim. lit-ry, 1956.
190 p. (MIRA 10:1)

(Gases) (Vapors) (Adsorption)

SOV/153-2-3-8/29

5(4)

AUTHOR: Serpionova, Ye. N.

TITLE: Determination of the Duration of the Adsorption Process for the First Range of the Langmuir Isotherm

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Khimiya i khimicheskaya tekhnologiya, 1959, Vol 2, Nr 3, pp 352-359 (USSR)

ABSTRACT: In order to determine the duration of adsorption, the approximation formulas by Zhukhovitskiy, Tikhonov, and Zabezhinskiy (Refs 1 and 2) are widely used; moreover, Schumann (Ref 3) suggested a graphical solution (Fig 1). In the present paper a new graphical solution is suggested; the corresponding diagrams are shown by figures 2 and 3. These diagrams make it possible to determine the quantity h_{equ} from which the period τ and the mass transfer coefficient β may be computed. (h_{equ} denotes the height of the adsorption layer equivalent to one transfer unit.) It is shown by two examples that the method is simple and sufficiently precise. The agreement with experimental results and the results of the computation according to Zhukhovitskiy, Tikhonov, and Zabezhinskiy

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